

Serial No.: 09/186, 247

LISTING OF CLAIMS:

We claim:

1. (currently amended) A method for digitally processing integer transform data representing a phenomenon, said integer transform data having an original precision as real domain data input for forward transformation and quantization in forming said integer transform data, the method comprising:

employing only said integer transform data while performing an inverse transform of said integer transform data to the real domain directly forming high-precision numbers having a precision greater than said original precision; and

maintaining said greater precision while manipulating said high-precision numbers to produce an effect.

2. (previously amended) A method as recited in claim 1, wherein said step of manipulating results in manipulated high precision numbers, and further comprising converting said manipulated high-precision numbers to integers and clipping the integers to an allowed range forming converted data.

3. (original) A method as recited in claim 1, wherein the phenomenon is an image.

4. (original) A method as recited in claim 1, wherein said effect is the chroma-key merging of two data sets.

5. (original) A method as recited in claim 1, wherein said effect is the color correction of image data.

DOCKET NUMBER: YOR91998-0331US1

2/24

Serial No.: 09/186, 247

- 1 6. (original) A method as recited in claim 3, wherein said effect is a 90 degree rotation of the
2 image.
- 3 7. (original) A method as recited in claim 1, wherein said high-precision numbers are floating
4 point numbers.
- 5 8. (original) A method as recited in claim 1, wherein said high-precision numbers are fixed
6 precision numbers including a fractional part.
- 7 9. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
8 discrete cosine transform.
- 9 10. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
10 discrete wavelet transform.
- 11 11. (original) A method as recited in claim 1, wherein the step of performing employs an inverse
12 discrete Fourier transform.
- 13 12. (withdrawn) A method for digitally processing transform data ~~in the real domain~~
14 representing a phenomenon, the method comprising:
- 15 performing an inverse transform of said transform data to the real domain forming
16 high-precision numbers; and
- 17 performing a forward transform of said high-precision numbers.
- 18 13. (withdrawn) A method as recited in claim 12, wherein the inverse to said forward transform
19 is different from said inverse transform.

DOCKET NUMBER: YOR91998-0331US1

3/24

Serial No.: 09/186, 247

- 1 14. (withdrawn) A method as recited in claim 13, wherein said forward transform is a forward
2 discrete cosine transform and said inverse transform is an inverse discrete wavelet
3 transform.
- 4 15. (previously amended) A method as recited in claim 1, further comprising implementing an
5 inverse quantization of transform-coded data forming the integer transform data.
- 6 16. (original) A method as recited in claim 15, further comprising converting said high-precision
7 numbers to integers and clipping the integers to an allowed range forming converted data.
- 8 17. (original) A method as recited in claim 15, further comprising entropy decoding coded data
9 to form the transform-coded data
- 10 18. (original) A method as recited in claim 17, wherein said coded data are coded image data.
- 11 19. (original) A method as recited in claim 17, wherein said coded data are coded video data.
- 12 20. (original) A method as recited in claim 18, wherein said coded image data are in a JPEG still
13 image international standard format.
- 14 21. (original) A method as recited in claim 19, wherein said coded video data are in a MPEG
15 motion video international standard format.
- 16 22. (original) A method as recited in claim 15, wherein the step of performing employs an
17 inverse discrete cosine transform.
- 18 23. (original) A method as recited in claim 15, wherein the step of performing employs an
19 inverse discrete wavelet transform.

DOCKET NUMBER: YOR91998-0331US1

4/24

Serial No.: 09/186, 247

1 24. (original) A method as recited in claim 15, wherein the step of performing employs an
2 inverse discrete Fourier transform.

3 25. (original) A method as recited in claim 15, wherein said high-precision numbers are fixed
4 precision numbers that include a fractional part.

5 26. (withdrawn) A method as recited in claim 12, further comprising manipulating said
6 high-precision numbers to produce an effect.

7 27. (withdrawn) A method for digitally processing transform-coded data representing a
8 phenomenon, the method comprising:

9 performing an inverse quantization of the transform-coded data forming transform data;

10 performing an inverse transform of said transform data to the real domain forming
11 high-precision numbers;

12 performing a forward transform of said high-precision numbers forming forward
13 transformed data; and

14 performing a quantization of said forward transformed data forming quantized data.

15 28. (withdrawn) A method as recited in claim 27, further comprising:

16 entropy decoding coded data forming transform-coded data employing entropy decode;
17 and

18 entropy encoding the quantized data employing entropy encode forming encoded data.

DOCKET NUMBER: YOR91998-0331US1

5/24

Serial No.: 09/186, 247

- 1 29. (withdrawn) A method as recited in claim 27, further comprising manipulating said
2 high-precision numbers to produce an effect.
- 3 30. (withdrawn) A method as recited in claim 27, further comprising converting said
4 high-precision numbers to integers and clipping to an allowed range forming converted
5 data.
- 6 31. (withdrawn) A method as recited in claim 29, further comprising alternating manipulating
7 steps with the steps of performing a forward transform, performing a quantization,
8 entropy encoding, entropy decoding, performing an inverse quantization, and performing
9 an inverse transform a desired number of times.
- 10 32. (withdrawn) A method as recited in claim 31, wherein said coded data are compressed data,
11 and each step of alternating implements a compression/decompression cycle.
- 12 33. (withdrawn) A system employing the method recited in claim 31, wherein each step of
13 alternating recompresses and decompresses coded data to enable an editing operation.
- 14 34. (withdrawn) A method as recited in claim 28, wherein said coded data are coded audio data.
- 15 35. (withdrawn) A method as recited in claim 28, wherein said coded data are coded
16 electromagnetic environment data.
- 17 36. (withdrawn) A method as recited in claim 28, wherein said coded data are coded video data.
- 18 37. (withdrawn) A method as recited in claim 28, wherein said coded data is encoded in the
19 JPEG standard format.
- 20 38. (withdrawn) A system for digitally processing first level transform-coded data in the real
21 domain representing a phenomenon, the system comprising:

DOCKET NUMBER: YOR91998-0331US1

6/24

Serial No.: 09/186, 247

- 1 a first inverse quantizer to generate transform data from said transform-coded data;
- 2 a first inverse transformer to produce an inverse transform of said transform data to the
3 real domain forming high-precision numbers;
- 4 a first forward transformer for forward transforming said high-precision numbers forming
5 forward transformed data; and
- 6 a first quantizer for quantizing said forward transformed data to form quantized data.
- 7 39. (withdrawn) A system as recited in claim 38, wherein the forward transformer employs a
8 different transform type than a first transform type employed by the inverse transformer.
- 9 40. (withdrawn) A system as recited in claim 38, wherein said forward transformer produces a
10 forward discrete cosine transform and said inverse transformer produces an inverse
11 discrete wavelet transform.
- 12 41. (withdrawn) A system as recited in claim 38, further comprising:
- 13 a manipulator for manipulating the high-precision numbers to produce an effect.
- 14 42. (withdrawn) A system as recited in claim 38, wherein said inverse quantizer and said
15 quantizer use identical quantization values.
- 16 43. (withdrawn) A system as recited in claim 41, wherein only a subset of the quantized
17 transform data produced different transform-coded data.
- 18 44. (withdrawn) A system as recited in claim 38, wherein said inverse quantizer and said
19 quantizer use at least one different quantization value.

DOCKET NUMBER: YOR91998-0331US1

7/24

Serial No.: 09/186, 247

1 45. (withdrawn) A system as recited in claim 38, further comprising:

2 an entropy decoder to form the transform-coded data from coded data; and

3 an entropy encoder to encode the quantized data.

4 46. (currently amended) A system for digitally processing integer transform data representing a
5 phenomenon, said integer transform data having an original precision as real domain data
6 input for forward transformation and quantization in forming said integer transform data.
7 the system comprising:

8 an inverse transformer to perform an inverse transform of the integer transform data to
9 the real domain directly forming using high-precision numbers having a precision
10 greater than said original precision employing only said inverse transform; and

11 a manipulator to manipulate the high-precision numbers to produce an effect while
12 maintaining said greater precision.

13 47. (previously amended) A system as recited in claim 46, wherein said manipulator forms
14 manipulated high precision numbers, and further comprising a converter to convert said
15 manipulated high-precision numbers to integers, and a clipper to clip the integers to an
16 allowed range.

17 48. (currently amended) A system for digitally processing transform-coded data representing a
18 phenomenon, said transform coded data having an original precision as real domain data
19 input for forward transformation and quantization in forming said transform coded
20 transform data. the system comprising:

DOCKET NUMBER: YOR91998-0331US1

8/24

Serial No.: 09/186, 247

1 an inverse quantizer to perform an inverse quantization of said transform-coded data to
2 form integer transform data;

3 an inverse transformer to perform an inverse transform of said integer transform data to
4 the real domain directly forming high-precision numbers having a precision
5 greater than said original precision employing only said integer transform data;
6 and

7 a manipulator for manipulating the high-precision numbers to produce an effect while
8 maintaining said greater precision.

9 49. (original) A system as recited in claim 48, further comprising a converter to convert said
10 high-precision numbers to integers, and a clipper to clip the integers to an allowed range.

11 50. (withdrawn) A system for digitally processing transform data in the real domain representing
12 a phenomenon, the system comprising:

13 an inverse transformer to produce an inverse transform of the transform data to the real
14 domain to form high-precision numbers; and

15 a forward transformer to forward transform the high-precision numbers.

16 51. (withdrawn) A system as recited in claim 50, further comprising:

17 a manipulator to manipulate the high-precision numbers to produce an effect.

18 52. (withdrawn) A system as recited in claim 41, wherein the quantized data forms an other level
19 of transform-coded data and further comprising:

DOCKET NUMBER: YOR91998-0331US1

9/24

Serial No.: 09/186, 247

1 another inverse quantizer, another inverse transformer, another manipulator, another
2 forward transformer, and another quantizer to perform together a similar function
3 on the other level of transform-coded data as performed on the first level
4 transform-coded data.

5 53. (withdrawn) A system as recited in claim 52, wherein the effect produced by the first
6 manipulator is a different type of effect from that produced by the other manipulator.

7 54. (withdrawn) A system as recited in claim 52, wherein the functions of the first inverse
8 quantizer, first inverse transformer, first forward transformer, and first quantizer, and the
9 respective functions of said another inverse quantizer, another inverse transformer,
10 another forward transformer, and another quantizer are each performed by a same
11 module.

12 55. (original) A method as recited in claim 2, further comprising providing said converted data
13 for use by an output device.

14 56. (original) A method as recited in claim 55, wherein the output device is a display monitor.

15 57. (original) A method as recited in claim 55, wherein the output device is a raster display
16 monitor.

17 58. (previously amended) A method as recited in claim 1, wherein the integer transform data
18 includes information of a spectral analysis.

19 59. (currently amended) An article of manufacture comprising a computer usable medium having
20 computer readable program code means embodied therein for digitally processing integer
21 transform data representing a phenomenon, said integer transform data having an original
22 precision as real domain data input for forward transformation and quantization in
23 forming said integer transform data, the computer readable program code means in said

DOCKET NUMBER: YOR91998-0331US1

10/24

Serial No.: 09/186, 247

1 article of manufacture comprising computer readable program code means for causing a
2 computer to effect:

3 employing only said integer transform data while performing an inverse transform of said
4 integer transform data to the real domain directly forming high-precision numbers
5 having a precision greater than said original precision; and

6 maintaining said greater precision while manipulating said high-precision numbers to
7 produce an effect.

8 60. (original) An article of manufacture as recited in claim 59, the computer readable program
9 code means in said article of manufacture further comprising computer readable program
10 code means for causing a computer to effect converting said high-precision numbers to
11 integers and clipping the integers to an allowed range forming converted data.

12 61. (original) An article of manufacture as recited in claim 59, wherein the phenomenon is an
13 image.

14 62. (withdrawn) A computer program product comprising a computer usable medium having
15 computer readable program code means embodied therein for digitally processing
16 transform data in the real domain representing a phenomenon, the computer readable
17 program code means in said computer program product comprising computer readable
18 program code means for causing a computer to effect:

19 performing an inverse transform of said transform data to the real domain forming
20 high-precision numbers; and

21 performing a forward transform of said high-precision numbers.

DOCKET NUMBER: YOR91998-0331US1

11/24

Serial No.: 09/186, 247

63. (withdrawn) A computer program product as recited in claim 62, wherein the inverse to said forward transform is different from said inverse transform.

64. (withdrawn) A computer program product as recited in claim 62, wherein said forward transform is a forward discrete cosine transform and said inverse transform is an inverse discrete wavelet transform.

65. (currently amended) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for digitally processing transform-coded data representing a phenomenon, said transform coded data having an original precision as real domain data input for forward transformation and quantization in forming said transform coded transform data, said method steps comprising:

performing an inverse quantization of said transform-coded data forming integer transform data;

employing only said integer transform data while performing an inverse transform of said integer transform data to the real domain directly forming high-precision numbers having a precision greater than said original precision; and

maintaining said greater precision while manipulating said high-precision numbers to produce an effect.

66. (previously amended) A computer program product as recited in claim 65, wherein the step of manipulating results in manipulated high-precision numbers, the computer readable program code means in said computer program product further comprising converting said manipulated high-precision numbers to integers and clipping the integers to an allowed range forming converted data.

DOCKET NUMBER: YOR91998-0331US1

12/24

Serial No.: 09/186, 247

1 67. (withdrawn) A program storage device readable by machine, tangibly embodying a program
2 of instructions executable by the machine to perform method steps for digitally
3 processing transform-coded data representing a phenomenon, said method steps
4 comprising:

5 performing an inverse quantization of the transform-coded data forming transform data;

6 performing an inverse transform of said transform data to the real domain forming
7 high-precision numbers;

8 performing a forward transform of said high-precision numbers forming forward
9 transform data; and

10 performing a quantization of said forward transformed data forming quantized data.

11 68. (withdrawn) A program storage device readable by machine as recited in claim 67, said
12 method steps further comprising manipulating said high-precision numbers to produce an
13 effect.

14 69. (withdrawn) A program storage device readable by machine as recited in claim 67, said
15 method steps further comprising converting said high-precision numbers to integers and
16 clipping to an allowed range forming converted data.

17 70. (withdrawn) A program storage device readable by machine as recited in claim 67, said
18 method steps further comprising:

19 entropy decoding coded data forming transform-coded data employing entropy decode;
20 and

DOCKET NUMBER: YOR91998-0331US1

13/24

Serial No.: 09/186, 247

1 entropy encoding the quantized data employing lossless entropy encode forming encoded
2 data.

3 71. (withdrawn) A program storage device readable by machine as recited in claim 70, said
4 method steps further comprising alternating said manipulating steps with said steps of
5 performing a forward transform, performing a quantization, entropy encoding, entropy
6 decoding, performing an inverse quantization, and performing an inverse transform a
7 desired number of times.

8 72. (withdrawn) A program storage device readable by machine as recited in claim 71, wherein
9 said coded data are compressed data, and each step of alternating implements a
10 compression/decompression cycle.

11 73. (withdrawn) A program storage device readable by machine as recited in claim 70, wherein
12 the phenomenon is image data encoded in the JPEG standard format.

13 74. (withdrawn) A method for digitally processing transform data in the real domain
14 representing a phenomenon, the method comprising:

15 performing an inverse transform of said transform data to the real domain forming
16 high-precision numbers;

17 converting the high-precision numbers to integers which include out of range data; and

18 performing a forward transform of the integers forming forward transformed data.

19 75. (withdrawn) A method as recited in claim 74, further comprising manipulating the integers
20 to produce an effect.

21 76. (withdrawn) A method as recited in claim 74, further comprising:

DOCKET NUMBER: YOR91998-0331US1

14/24

Serial No.: 09/186, 247

1 performing an inverse quantization of transform-coded data to form the transform data;
2 and

3 performing a quantization of said forward transformed data forming quantized data.

4 77. (withdrawn) A method as recited in claim 74, further comprising clipping the integers to an
5 allowed range forming converted data.

6 78. (withdrawn) A method as recited in claim 76, further comprising alternating manipulating
7 steps with the steps of performing a forward transform, performing a quantization,
8 performing an inverse quantization, and performing an inverse transform a desired
9 number of times.

10 79. (withdrawn) A program storage device readable by machine, tangibly embodying a program
11 of instructions executable by the machine to perform method steps for digitally
12 processing transform data in the real domain representing a phenomenon, said method
13 steps comprising:

14 performing an inverse transform of said transform data to the real domain forming
15 high-precision numbers;

16 converting the high-precision numbers to integers which include out of range data; and

17 performing a forward transform of the integers forming forward transformed data.

18 80. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
19 comprising manipulating the integers to produce an effect.

DOCKET NUMBER: YOR91998-0331US1

15/24

Serial No.: 09/186, 247

1 81. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
2 comprising performing an inverse quantization of transform-coded data to form the
3 transform data.

4 82. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
5 comprising performing a quantization of said forward transformed data forming
6 quantized data.

7 83. (withdrawn) A program storage device readable by machine, as recited in claim 79, further
8 comprising clipping the integers to an allowed range forming converted data.

9 84. (original) A method as recited in claim 17, wherein said coded data are coded audio data.

10 85 (currently amended). A method for digitally processing transform-coded data representing a
11 phenomenon, said transform coded data having an original precision as real domain data
12 input for forward transformation and quantization in forming said transform coded
13 transform data, the method comprising:

14 implementing an inverse quantization of the transform-coded data forming transform
15 data;

16 employing only said transform data while performing an inverse transform of said
17 transform data to the real domain directly forming high-precision numbers having
18 a precision greater than said original precision; and

19 maintaining said greater precision while manipulating said high-precision numbers to
20 produce an effect.

21 86. (new) A method as recited in claim 85, wherein the step of manipulating results in
22 manipulated high-precision numbers, and further comprising converting said manipulated

DOCKET NUMBER: YOR91998-0331US1

16/24

Serial No.: 09/186, 247

1 high-precision numbers to integers and clipping the integers to an allowed range forming
2 converted data.

3 87. (new) A program storage device readable by machine, tangibly embodying a program of
4 instructions executable by the machine to perform method steps for digitally processing
5 transform-coded data representing a phenomenon, said method steps comprising the steps
6 of claim 85.

7 88. (currently amended) A system for digitally processing transform-coded data representing a
8 phenomenon, said transform coded data having an original precision as real domain data
9 input for forward transformation and quantization in forming said transform coded
10 transform data, the system comprising:

11 a first inverse quantizer to generate an inverse quantization of the transform-coded data
12 forming transform data;

13 a first inverse transformer to produce an inverse transform of said transform data to the
14 real domain directly forming high-precision numbers having a precision greater
15 than said original precision employing only said integer transform data; and

16 a manipulator for manipulating the high-precision numbers to produce an effect while
17 maintaining said greater precision.

18 89. (currently amended) An article of manufacture comprising a computer usable medium having
19 computer readable program code means embodied therein for causing digitally processing
20 of transform-coded data representing a phenomenon, said transform coded data having an
21 original precision as real domain data input for forward transformation and quantization
22 in forming said transform coded transform data, the computer readable program code
23 means in said article of manufacture comprising computer readable program code means
24 for causing a computer to effect the steps of:

DOCKET NUMBER: YOR91998-0331US1

17/24

Serial No.: 09/186, 247

1 implementing an inverse quantization of the transform-coded data forming transform
2 data;

3 employing only said integer transform data while performing an inverse transform of said
4 transform data to the real domain directly forming high-precision numbers having a
5 precision greater than said original precision; and

6 maintaining said greater precision while manipulating said high-precision numbers to
7 produce an effect.

8 90. (currently amended) A computer program product comprising a computer usable medium
9 having computer readable program code means embodied therein for causing digital processing
10 of transform-coded data representing a phenomenon, said transform coded data having an
11 original precision as real domain data input for forward transformation and quantization in
12 forming said transform coded transform data, the computer readable program code means in said
13 computer program product comprising computer readable program code means for causing a
14 computer to effect the functions of:

15 a first inverse quantizer to generate an inverse quantization of the transform-coded data
16 forming transform data;

17 a first inverse transformer to produce an inverse transform of said transform data to the
18 real domain directly forming high-precision numbers having a precision greater than said
19 original precision employing only said transform data; and

20 a manipulator for manipulating the high-precision numbers to produce an effect while
21 maintaining said greater precision.

DOCKET NUMBER: YOR91998-0331US1

18/24